

## Claims

1. In a network having interconnected nodes and data tuples to represent nodal connections, a method for calculating connections between nodes, the method comprising:
  - identifying singly heard host links; and
  - building tuples to represent an infrastructure connected to the singly heard host links.
2. The method of claim 1, further comprising:
  - resolving conflicts among tuples; and
  - removing redundant neighbor information for connector-to-host links.
3. The method of claim 2, wherein the step of resolving conflicts comprises:
  - identifying a single conflict link tuple having a host that is identified in an extra host link tuple;
  - determining whether the extra host link tuple and the single conflict link tuple have the same port specification for the host; and
  - if the port specification is the same, classifying the single conflict link tuple as a singly heard host link tuple.
4. The method of claim 2, wherein the step of removing redundant data comprises:
  - identifying a multi-heard host link tuple having a host that is identified in an extra host link tuple,
  - determining whether the extra host link tuple and the multi-heard host link tuple have a different port specification for the host; and
  - if the port specification is different, classifying the multi-heard host link tuple as an extra host link tuple.
5. The method of claim 1, further comprising:
  - clarifying device connectivity by requesting additional information about nodal connections,
  - and
  - consolidating tuples for shared media devices.
6. The method of claim 1, wherein the step of identifying singly heard host links comprises:
  - identifying conn-to-conn link tuples;

1 identifying conn-to-host tuples; and  
2 if a tuple is a conn-to-host tuple hearing a first host on a first port, determining whether the  
3 connector hears any other hosts on the first port; and  
4 if the connector hears any other host on the first port, classifying the tuple as a multi-  
5 heard host link tuple.

6 7. The method of claim 1, wherein the step of building comprises:  
7 creating tuples based on singly-heard host links;  
8 creating tuples based on conn-to-conn links using existing tuples;  
9 creating tuples based on conn-to-conn links using extra host links tuples; and  
10 attempting to disprove invalid conn-to-conn links tuples.

11 8. A system for managing a network by mapping the network's topology using tuples  
12 to represent connections between network nodes comprising:

13 a tuple manager that gathers data from the network nodes; and  
14 a connection calculator that builds tuples based on the data gathered by the tuple manager.

15 9. The system of claim 8, wherein the connection calculator identifies singly heard host  
16 links, and builds tuples to represent an infrastructure connected to the singly heard host links.

17 10. The system of claim 9, wherein the connection calculator identifies singly heard host  
18 links by

19 identifying conn-to-conn link tuples;  
20 identifying conn-to-host tuples; and

21 if a tuple is a conn-to-host tuple hearing a first host on a first port, determining whether the  
22 connector hears any other hosts on the first port; and

23 if the connector hears any other host on the first port, classifying the tuple as a multi-  
24 heard host link tuple.

25 11. The system of claim 8, wherein the connection calculator resolves conflicts among  
26 tuples, and removes redundant neighbor information for connector-to-host links.

09703962 103100

12. The system of claim 8, wherein the connection calculator clarifies device connectivity by requesting the tuple manager to obtain additional information about nodal connections, and consolidates tuples for shared media devices.

13. The system of claim 8, wherein the connection calculator builds tuples by:  
creating tuples based on singly-heard host links;  
creating tuples based on conn-to-conn links using existing tuples;  
creating tuples based on conn-to-conn links using extra host links tuples; and  
attempting to disprove invalid conn-to-conn links tuples.

14. A computer-readable medium having computer-executable instructions for performing a method for calculating connections between nodes of a network comprising:  
identifying singly heard host links; and  
building tuples to represent an infrastructure connected to the singly heard host links.

15. The medium of claim 14, wherein the method comprises:  
resolving conflicts among tuples by requesting additional information about nodal connections; and  
removing redundant neighbor information for connector-to-host links.

16. The method of claim 15, wherein the step of resolving conflicts comprises:  
identifying a single conflict link tuple having a host that is identified in an extra host link tuple;  
determining whether the extra host link tuple and the single conflict link tuple have the same port specification for the host; and  
if the port specification is the same, classifying the single conflict link tuple as a singly heard host link tuple.

17. The method of claim 15, wherein the step of removing redundant data comprises:  
identifying a multi-heard host link tuple having a host that is identified in an extra host link tuple,  
determining whether the extra host link tuple and the multi-heard host link tuple have a different port specification for the host; and

1 if the port specification is different, classifying the multi-heard host link tuple as an extra host  
2 link tuple.

3 18. The medium of claim 14, wherein the method comprises:  
4 clarifying device connectivity, and  
5 consolidating tuples for shared media devices.

6 19. The medium of claim 14, wherein the step of identifying singly heard host links  
7 comprises:

8 identifying conn-to-conn link tuples;

9 identifying conn-to-host tuples; and

10 if a tuple is a conn-to-host tuple hearing a first host on a first port, determining whether the  
11 connector hears any other hosts on the first port; and

12 if the connector hears any other host on the first port, classifying the tuple as a multi-  
13 heard host link tuple.

14 20. The medium of claim 14, wherein the step of building comprises:

15 creating tuples based on singly-heard host links;

16 creating tuples based on conn-to-conn links using existing tuples;

17 creating tuples based on conn-to-conn links using the extra host links tuples; and

18 attempting to disprove invalid conn-to-conn links tuples.